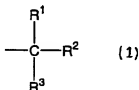


## Scope of Claims

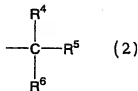
1. A positive-working radiation-sensitive composition which is characterized in that it is a positive-working radiation-sensitive composition containing a) a compound with an alkali-soluble group protected by an acid labile group and b) an acid generator which generates acid by irradiation with radiation, and any of the following conditions a1) to a3) are satisfied.

a1) The alkali-soluble group is a carboxyl group and the acid labile group is represented by general formula (1)



(R<sup>1</sup> and R<sup>2</sup> are aromatic rings, and R<sup>3</sup> represents an alkyl group, a substituted alkyl group, a cycloalkyl group or an aromatic ring; and R<sup>1</sup> to R<sup>3</sup> may be the same or different.)

a2) The acid labile group is represented by general formula (2)



(R<sup>4</sup> to R<sup>6</sup> are each an alkyl group, a substituted alkyl group, a cycloalkyl group or an aromatic ring, and at least one of R<sup>4</sup> to R<sup>6</sup> is an aromatic ring with an electron-donating group; and R<sup>4</sup> to R<sup>6</sup> may be the same or different.)

a3) The acid labile group a has an alkali-soluble group or alternatively the acid labile group a has an alkali-soluble group protected by an acid labile group b.

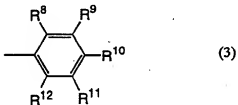
2. A positive-working radiation-sensitive composition according to Claim 1 where condition a1) is satisfied.

3. A positive-working radiation-sensitive composition according to Claim 2 which is characterized in that R<sup>1</sup> to R<sup>3</sup> are each independently an aryl group or a substituted aryl group.

4. A positive-working radiation-sensitive composition according to Claim 1 where condition a2) is satisfied.

5. A positive-working radiation-sensitive composition according to Claim 4 which is characterized in that the alkali-soluble group in the compound meeting condition a2) is a carboxyl group or a phenolic hydroxy group.

6. A positive-working radiation-sensitive composition according to Claim 4 which is characterized in that the aromatic ring with an electron-donating group is of structure represented by general formula (3).



(R<sup>8</sup>, R<sup>10</sup> and R<sup>12</sup> each independently represents a hydrogen atom, an alkyl group with 1 to 4 carbons or an alkoxy group with 1 to 6 carbons, and at least one of these represents such an alkyl group or alkoxy group. R<sup>9</sup> and R<sup>11</sup> each independently

represents a hydrogen atom, an alkyl group with 1 to 4 carbons or an alkoxy group with 1 to 6 carbons.)

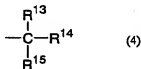
7. A positive-working radiation-sensitive composition according to Claim 4 where the electron-donating group is an alkoxy group with 1 to 6 carbons.

8. A positive-working radiation-sensitive composition according to Claim 1 where condition a3) is satisfied.

9. A positive-working radiation-sensitive composition according to Claim 8 which is characterized in that the acid labile group a in the compound meeting condition a3) has at least one phenolic hydroxyl group, or alternatively a phenolic hydroxyl group further protected with acid labile group b.

10. A positive-working radiation-sensitive composition according to Claim 8 which is characterized in that the acid labile group a in the compound meeting condition a3) has at least one carboxyl group or alternatively a carboxyl group further protected with acid labile group b.

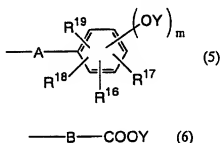
11. A positive-working radiation-sensitive composition according to Claim 8 which is characterized in that the labile group a in the compound meeting condition a3) is a group represented by general formula (4).



(R<sup>13</sup> to R<sup>15</sup> are each independently an alkyl group, a substituted alkyl group, a cycloalkyl group, an aryl group, a substituted aryl group, a group containing an alkali-soluble

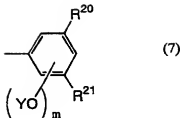
group, or a group containing an alkali-soluble group protected by acid labile group  $b$ , and at least one is a group containing an alkali-soluble group, or a group containing an alkali-soluble group protected by acid labile group  $b$ .  $R^{13}$  to  $R^{15}$  may be the same or different.)

12. A positive-working radiation-sensitive composition  
8 according to Claim 11 which is characterized in that at least  
one of  $R^{13}$  to  $R^{15}$  in general formula (4) is a group  
represented by general formula (5) or (6).



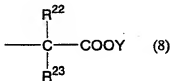
(A represents an alkylene group with 1 to 4 carbons, an arylene group with 6 to 10 carbons or a single bond. B represents an alkylene group with 1 to 6 carbons, an arylene group with 6 to 10 carbons, an alkylenearylene group with 7 to 12 carbons or a single bond. R<sup>16</sup> to R<sup>19</sup> each independently represents a hydrogen atom or an alkyl group with 1 to 4 carbons. Y represents an acid labile group *b* or a hydrogen atom, and *m* is 1 to 3.)

13. A positive-working radiation-sensitive composition according to Claim 11 which is characterized in that at least one of  $R^{13}$  to  $R^{15}$  in general formula (4) is a group represented by general formula (7).



(R<sup>20</sup> and R<sup>21</sup> each independently represents a hydrogen atom or an alkyl group with 1 to 4 carbons. Y represents an acid labile group b or a hydrogen atom, and m is 1 to 3.)

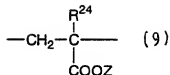
14. A positive-working radiation-sensitive composition according to Claim 11 which is characterized in that at least one of R<sup>13</sup> to R<sup>15</sup> of general formula (4) is of structure represented by general formula (8).



(R<sup>22</sup> and R<sup>23</sup> represent a hydrogen atom or an alkyl group with 1 to 4 carbons. Y represents an acid labile group b or a hydrogen atom.)

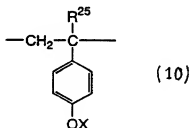
15. A positive-working radiation-sensitive composition according to Claim 1 which is characterized in that the compound meeting any of conditions a1) to a3) is a polymer of weight average molecular weight from 5,000 to 50,000.

16. A positive-working radiation-sensitive composition according to Claim 1 which is characterized in that the compound meeting any of conditions a1) to a3) is a polymer containing structural units represented by general formula (9).



(R<sup>24</sup> represents a hydrogen atom, an alkyl group with 1 to 4 carbons, a cyano group or a halogen. Z is a group represented by general formula (1), (2) or (4).

17. A positive-working radiation-sensitive composition according to Claim 4 or Claim 8 which is characterized in that the compound meeting condition a2) or a3) is a polymer containing structural units represented by general formula (10).



(R<sup>23</sup> represents a hydrogen atom, an alkyl group with 1 to 4 carbons, a cyano group or a halogen. X is an acid labile group represented by general formula (2) or (4).

18. A positive-working radiation-sensitive composition according to Claim 16 which is characterized in that R<sup>24</sup> is a cyano group or a halogen.

19. A method for the production of a pattern in which a positive-working radiation-sensitive composition according to Claim 1 is applied onto a substrate which is to undergo processing, and drying, exposure and development carried out.

20. A method of pattern production according to Claim 19 which is characterized in that the exposure is carried out by means of an electron beam.

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an alkali-soluble group or acid labile group a has an alkali-soluble group protected by an acid labile group b.

5 With this constitution, it is possible by means of the present invention to obtain a positive-working radiation-sensitive composition of high sensitivity having a resolution which enables sub-quarter micron pattern processing to be carried out.

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